

Former Cliffs-Dow Site Project Status Update

City of Marquette
Commission Work Session and Regular Meeting
December 16, 2019

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Environmental Quality Analyst

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Project Status Update Outline

1. Cliffs-Dow Operational History
2. Cliffs-Dow Post-Operations Property Activities
3. City's Acquisition of Cliffs-Dow Property
4. Agency Role in Oversight and Compliance
5. Environmental Response Activities and Data under Mixing Zone-Based Criteria
6. Site Redevelopment
7. Commission Discussion

Cliffs-Dow Operational History

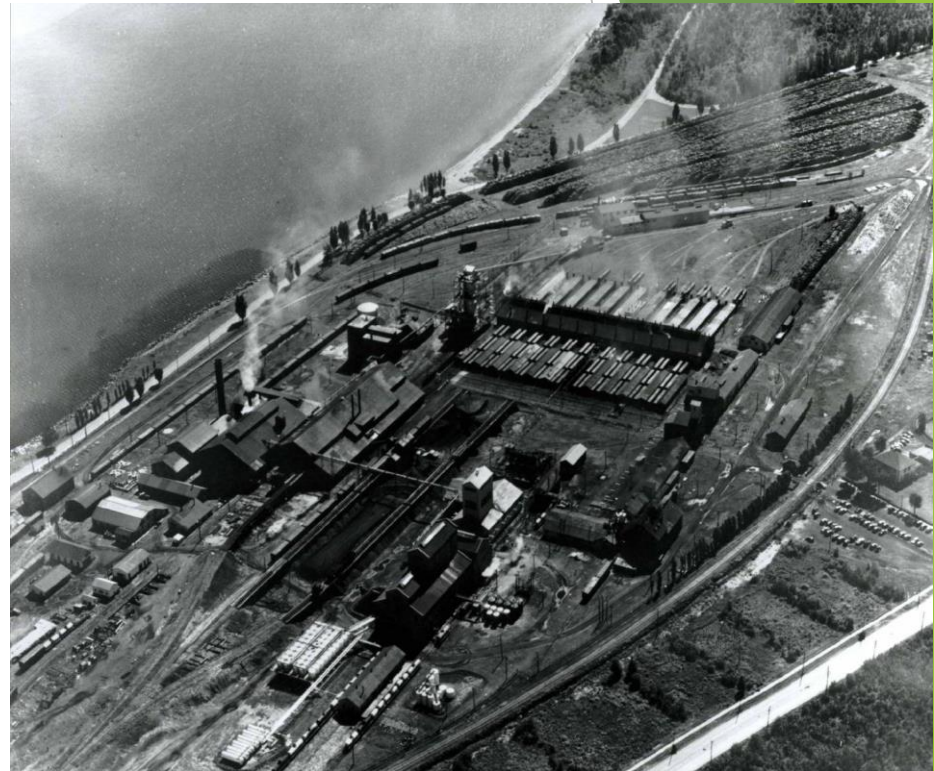
- **1902** Cleveland-Cliffs Iron Company Develops Property
- **1902 - 1930** Pig Iron Produced on Property
- **1935** Cliffs-Dow Chemical Company Created
- **1935 - 1968** Cliffs-Dow Produces Wood Chemicals
- **1968** Cliffs-Dow Company shares sold to Georgia-Pacific and E.L. Bruce
- **1969** Site Operations Cease
- **1969 - 1997** Demolition of Select Structures, Site Remains Vacant (except for North Parcel)

Cliffs-Dow Historical Aerial Photos

circa 1950's



North 9-acre Parcel
Discharge into Lake Superior



Central 46-acre Parcel
Discharge into Lake Superior

Post-Operations Property Activities

- 1969 - Property sold to C&W Corporation
- Ownership of property passed through several parties from 1969 to 1997
- Owners dismantled and removed most of the structures for scrap metal.
- Property sat idle until City's acquisition in 1997
- Photo circa 1993



Post-Operational Site Aerial Photos



1981



1992

City Acquisition of Property

- City of Marquette purchased ~77-acre property in October 1997 with the intent of securing control over redevelopment options for large undeveloped lakeshore property
- Historical Reports indicated limited soil and groundwater contamination at the site
- Deed Restriction placed on property limiting property to non-residential uses and prohibiting groundwater use
- A portion of the northern 9-acres (1998) and southern 23-acres (1999) were sold by the City
- In 1999, MDEQ requested interim response activities and outlined City's obligations as owner
- Approximately 46 acres remain



Regulatory Framework

- The Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA), regulates facilities of environmental contamination in Michigan. This law includes many “Parts” related to protecting human health and managing contaminated sites. EGLE’s Remediation and Redevelopment Division (RRD) administers two of these parts, or programs:
 - Environmental Remediation - Part 201
 - Leaking Underground Storage Tanks - Part 213
- Under Part 201 an owner or operator of property where a hazardous substance is present above cleanup criteria for unrestricted residential use may be required to perform response activities
- Applicable cleanup criteria to site include: Drinking Water, Drinking Water Protection, Direct Contact, Groundwater-Surface Water Interface, and Inhalation (ambient and indoor)
- The Deed Restriction for the property currently eliminates drinking water, residential direct contact and inhalation exposure routes
- The driver for regulatory compliance is Groundwater-Surface Water Interface (GSI)

Environmental Response Activities Performed

- In 2000, City initiated further assessment of the property as Responsible Party
- April 22, 2009, MDEQ requested City complete Interim Response Activities to address GSI Concerns
- August 2009 - September 2010 - Advanced 77 borings, Installed 49 monitoring wells
- October 2010 - Geophysical survey to identify potential source areas
- February 2011 - Test trenching completed to validate geophysical findings
- July 2011 - Limited source removal - 845 tons of tar in buried trenches and piping
- March 2012 - Remedial Alternatives Report submittal
- October 2009 thru November 2015 - Groundwater monitoring for GSI compliance
- April 2015 - Assessment work to support request for Mixing Zone (MZ)-based GSI Criteria
- October 2015 - Submitted preliminary request for MZ-based GSI Criteria to MDEQ
- February 2016 - Concluded MZ-based GSI Criteria may be applicable for site
- July 2016 - Submitted request to MDEQ RRD UP District Office for MZ-based GSI Criteria

Environmental Response Activities Performed (cont.)

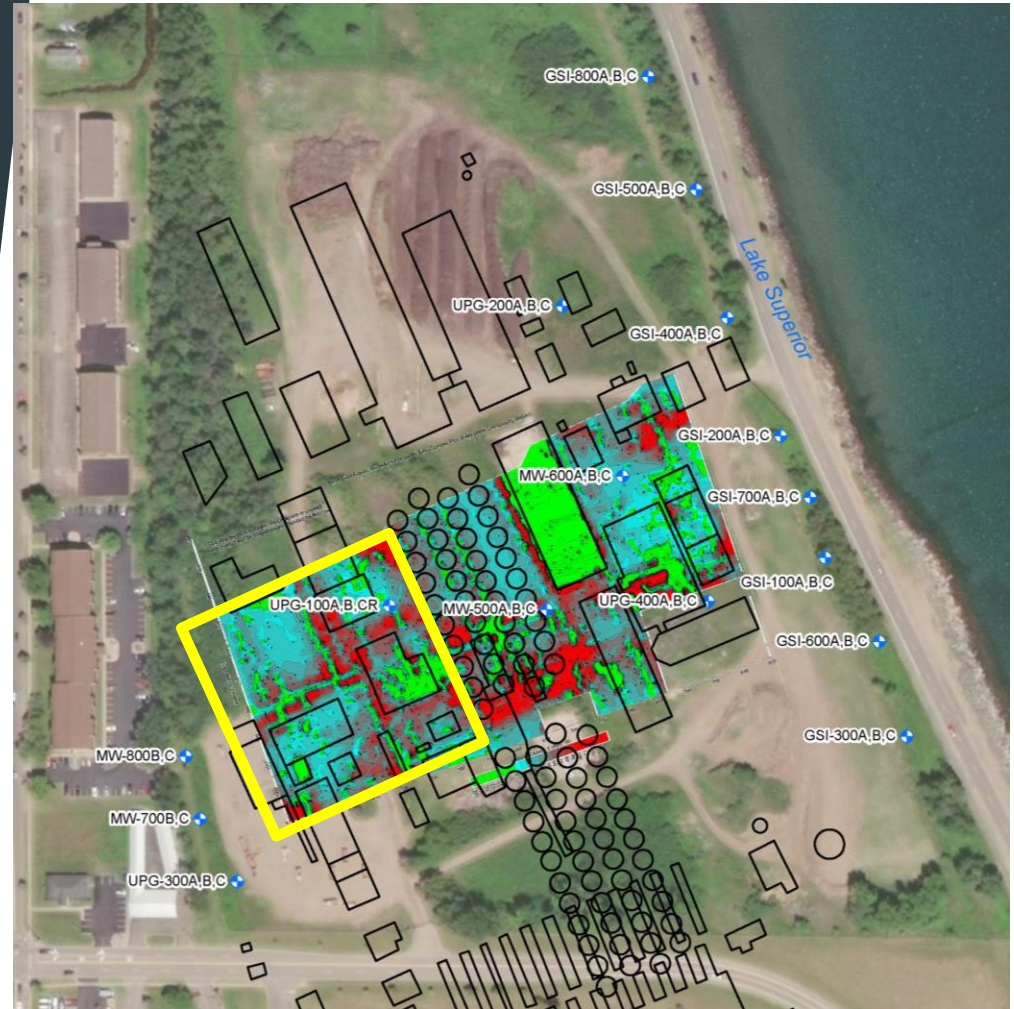
- September 2016 - MDEQ performs offshore geophysical, surface water, and sediment investigation
- September 2016 - MDEQ soil and groundwater assessment at former lagoon location (west of site)
- February 7, 2017 - MDEQ RRD UP District issues comments to request for MZ-based GSI Criteria
- September 2017 - MDEQ performs offshore sediment and pore water sampling
- November 7, 2017 - MDEQ RRD UP District issues calculated Mixing Zone-Based Groundwater-Surface Water Interface Criteria for Cliffs Dow Plant Site
- November 14, 2017 - Meeting with MDEQ RRD UP District Staff to review calculated mixing zone criteria and discuss development of a No Further Action(NFA) Report-Monitoring Only to allow DEQ to authorize the discharge
- April 2018 - Development of NFA report identifies constituents in groundwater at GSI compliance locations above Acute Mixing Zone-Based Criteria
- July 2018 - MDEQ performs additional offshore pore water and sediment sampling, ROV inspection of intake pipe extending into lake

Environmental Response Activities Performed (cont.)

- April 2019 - Work Plan developed to further characterize groundwater by alternate GSI compliance monitoring points
- July 2019- Alternate monitoring point installation and groundwater monitoring performed
- September 2019 - Work Plan developed to further characterize groundwater by alternate GSI compliance monitoring points
- October 2019 - Approval by EGLE to perform additional monitoring point installation and monitoring
- November 2019 - Additional monitoring point installation completed, monthly monitoring of select wells initiated
- April 2020 - Reporting of monitoring data to EGLE
- May 2020 - Data Evaluation with input from EGLE regarding future response activities
- June 2020 - Lakeshore Relocation Project - Potential opportunities for remedial action (i.e. cut-off wall, permeable reactive barrier, in-situ injection, etc.)
- Ongoing - MDEQ performs soil vapor monitoring at former lagoon location (west of site)

Geophysical Survey Results in Comparison to Historical Site Features

- Survey identified a series of linear features upgradient of groundwater impacts
- East-west linear feature believed to represent source area and preferential pathway

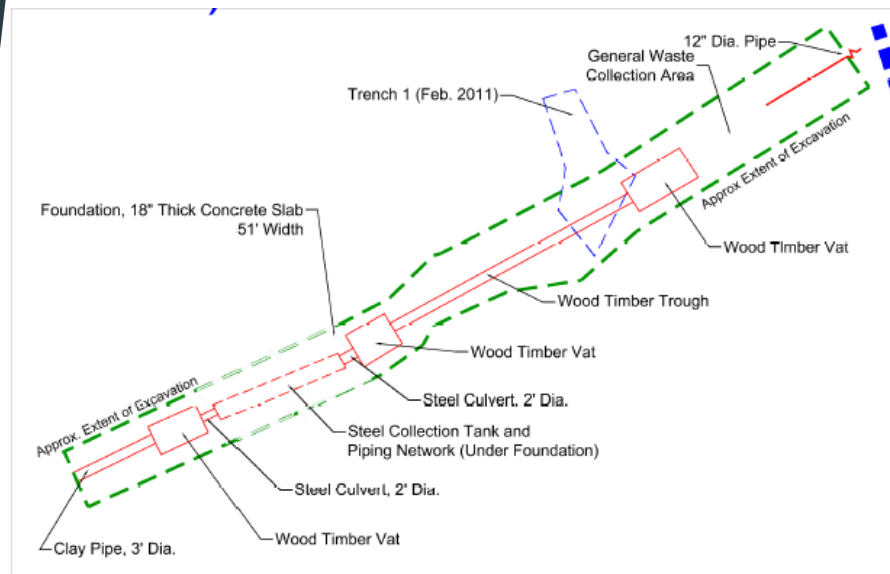


Source Area Removal - 2011

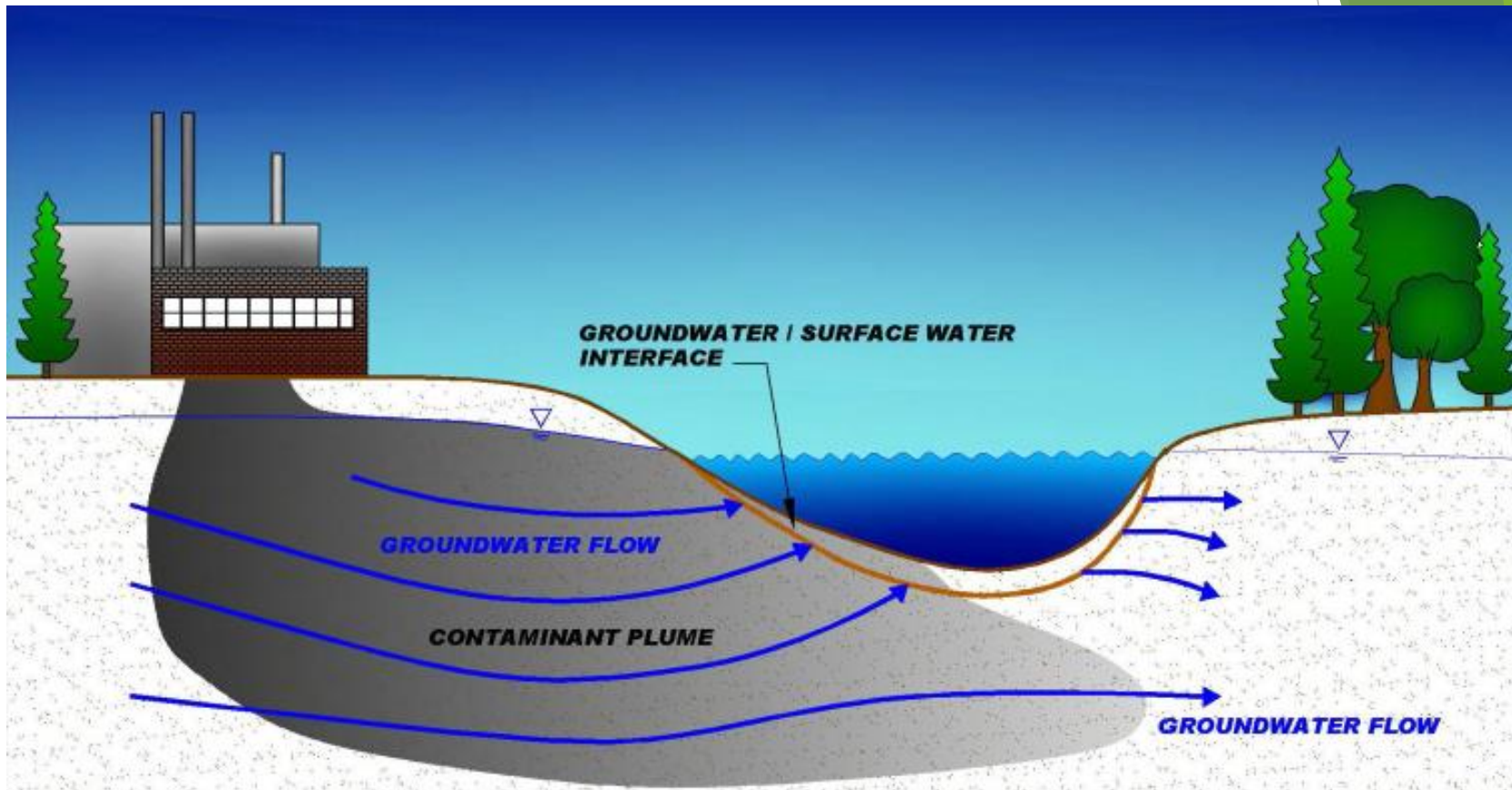
During investigative trenching activities performed at the Site in February 2011, viscous tar deposits adjacent to buried wood timbers were discovered in the southwest portion of the Site

The timbers and piping were found to originate off-site in the area of the former lagoon (now Presque Isle Place Apartments)

845 tons of tar conveyance materials (piping and wood structures), wood tar, and impacted soil were removed from the site for proper disposal



GSI and Mixing Zone



Groundwater-Surface Water Interface Pathway

GSI Pathway Remains a Concern

- What is Groundwater-Surface Water Interface or GSI?
 - GSI is defined as the location at which groundwater vents to a surface water body
 - The GSI pathway may be relevant if there is a hydraulic connection from the groundwater to the surface waters of the state
- What is a Mixing Zone?
 - A mixing zone is the portion of a surface water body in which venting groundwater is mixed with the receiving water.
- If generic GSI criteria are exceeded or reasonably expected to be exceeded at the GSI Interface, a person may request MDEQ approve a response activity that authorizes Mixing Zone-Based GSI Criteria pursuant to Section 3109a of NREPA. (R 299.5716(7) and (8))
- Allows discharge to be a regulated “permitted discharge” rather than an unregulated “unpermitted discharge”. A form of administrative closure based upon the contaminants migrating into a body of water not causing harm to human health or the environment

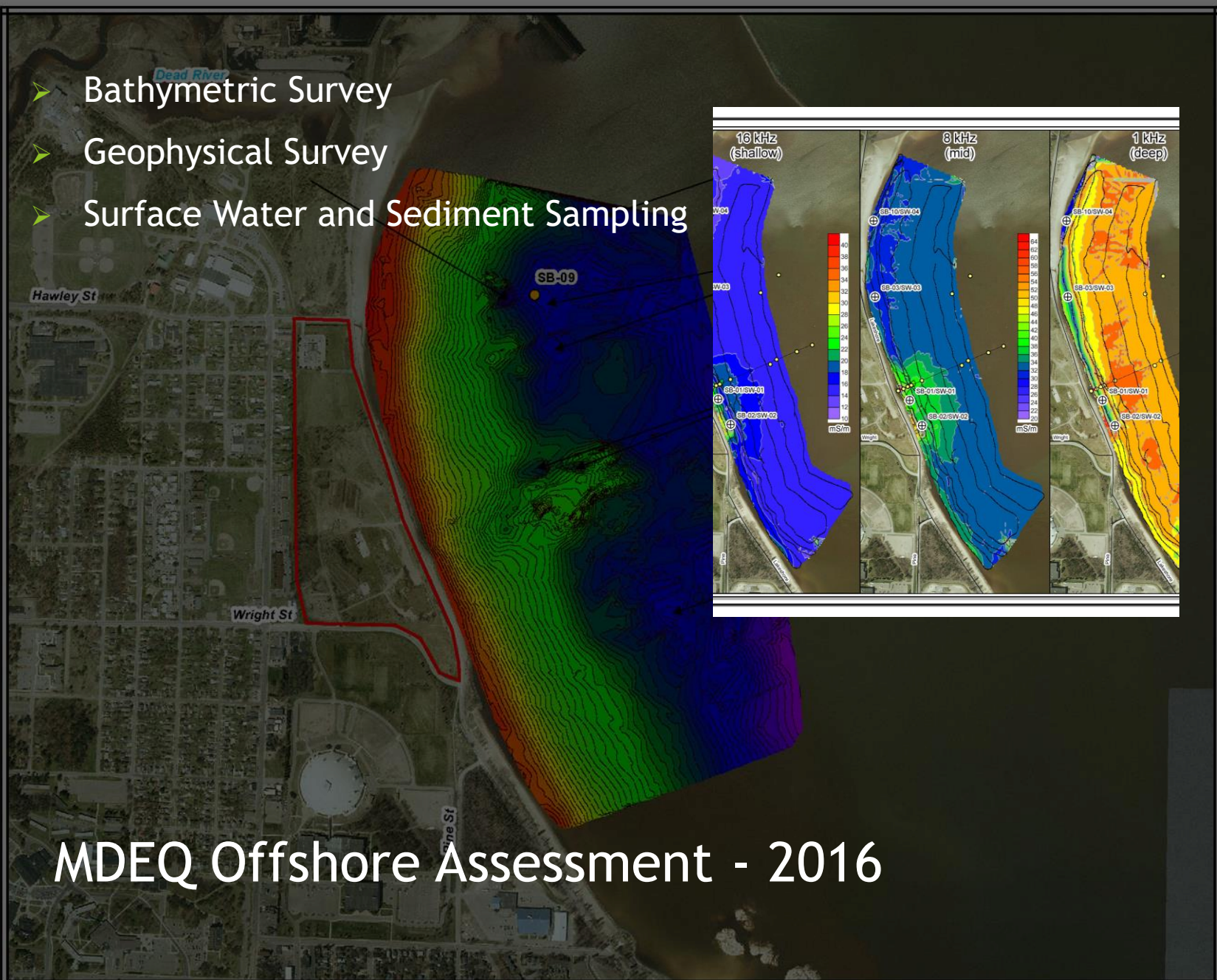
Activities to Support MZ Determination

- April 2015 - Assessment work to support request for Mixing Zone (MZ)-based GSI Criteria
- October 2015 - Submitted preliminary request for MZ-based GSI Criteria to MDEQ
- February 2016 - Concluded MZ-based GSI Criteria may be applicable for site
- July 2016 - Submitted request to MDEQ RRD UP District Office for MZ-based GSI Criteria
- February 7, 2017 - MDEQ RRD UP District issues comments to request for MZ-based GSI Criteria
- March 3, 2017 - Meeting with MDEQ RRD UP District Staff to review comments
- Revised MZ Determination Request, April 2017
- November 7, 2017 - MDEQ RRD UP District issues calculated Mixing Zone-Based Groundwater-Surface Water Interface Criteria for Cliffs Dow Plant Site

MZ Determination Outcomes

- MZ-based GSI Criteria will be considered as compliance criteria
- Groundwater results must meet criteria (Acute vs. Chronic)
- Periodic monitoring will be required to demonstrate compliance with criteria
- If monitoring results meet MZ-based criteria, site will be in compliance with Part 201 Regulations
- If monitoring results do not meet MZ-based criteria, response actions may be necessary

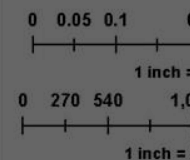
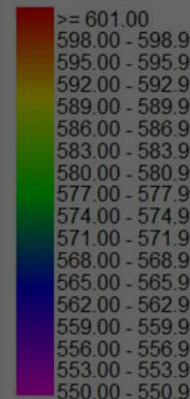
- Bathymetric Survey
- Geophysical Survey
- Surface Water and Sediment Sampling



MDEQ Offshore Assessment - 2016

LEGEND

Sample Location



DATUM: NAD83 & NGVD83
 PROJECTION: MICHIGAN
 SCALE: 1:10,000
 CONTOUR INTERVAL: 1 FOOT
 AERIAL PHOTO SOURCE: SHARED SOLUTIONS, BE

City of Marquette
 T48N R25W

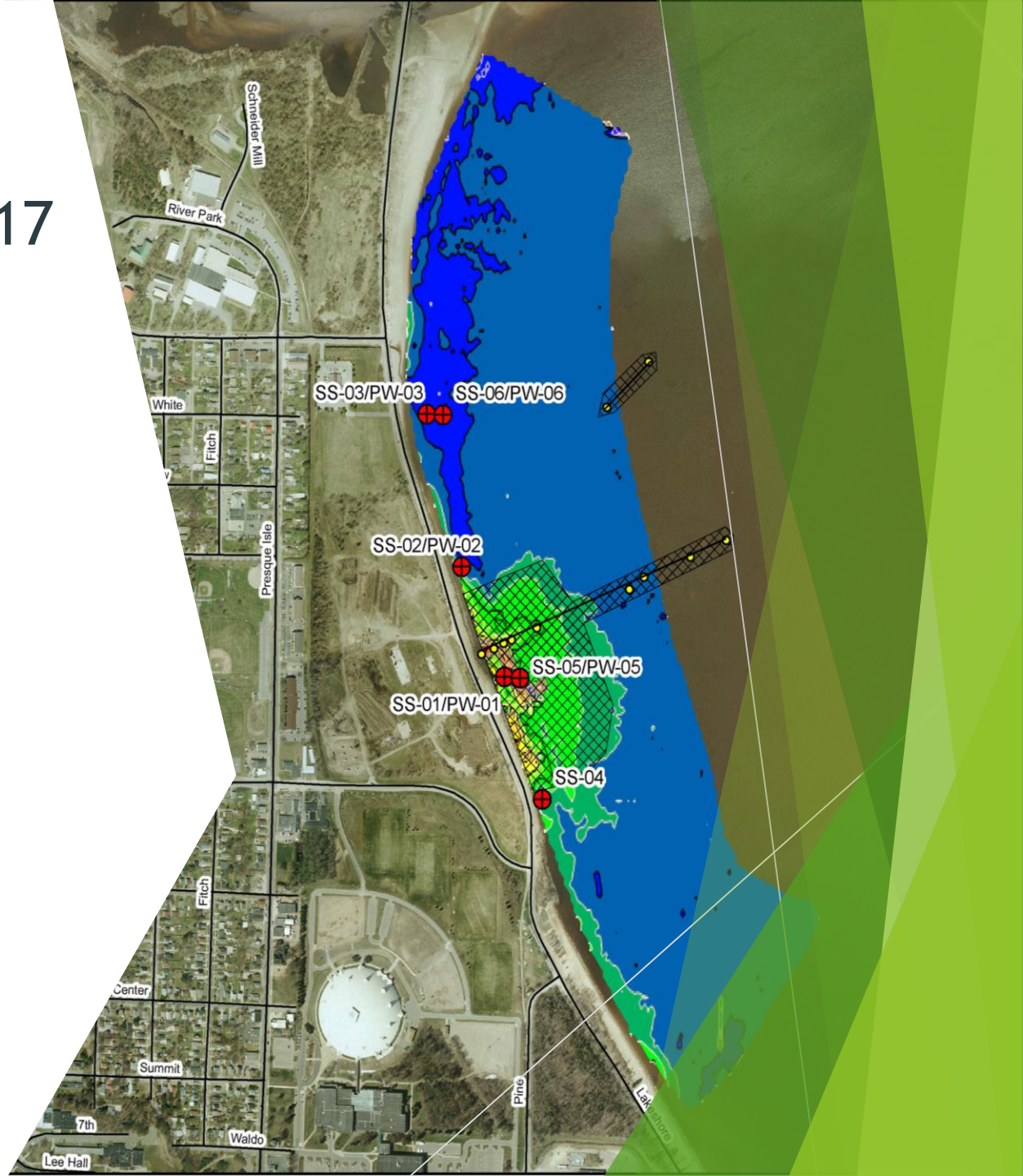
MAP SHOWING
 SURFACE

GEOLOGIST
 Daniel Peabody
 Geological Services Unit

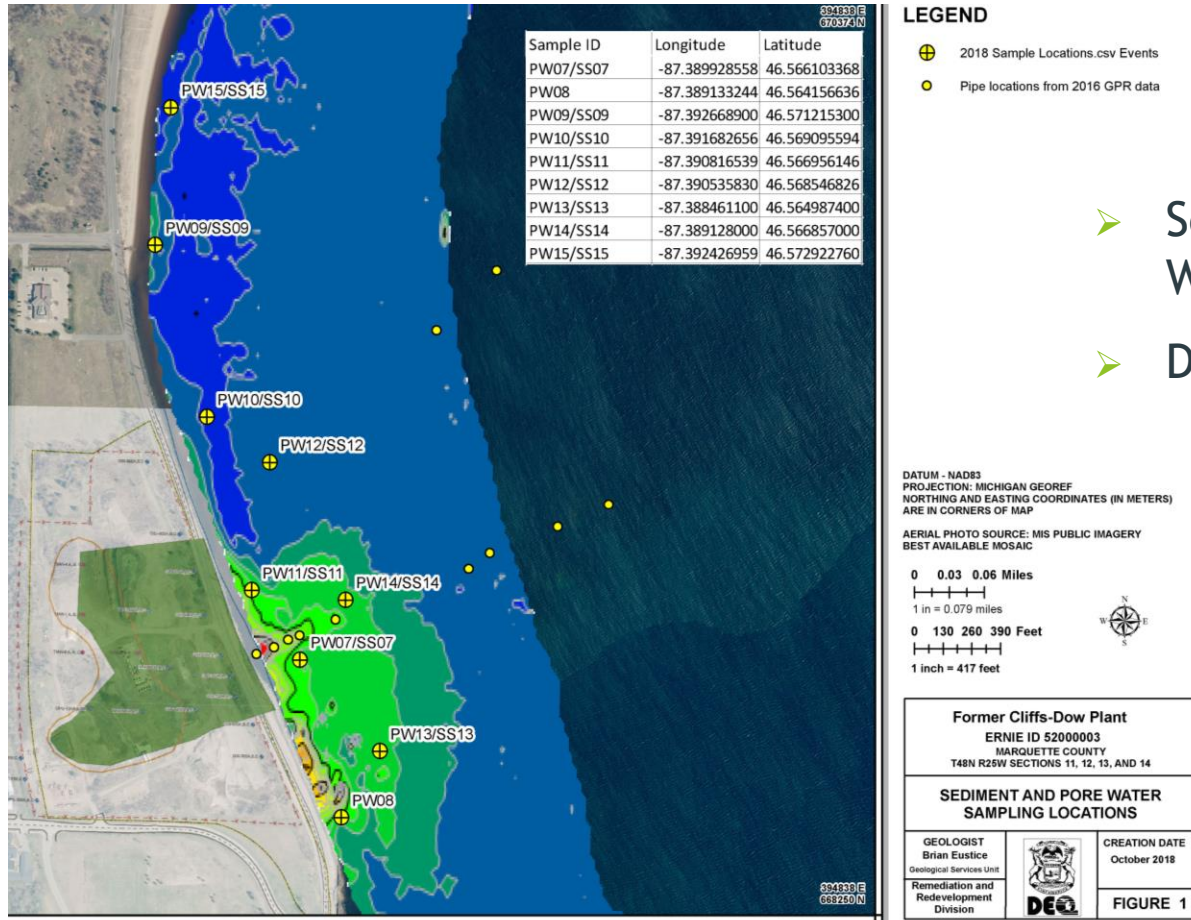
Remediation and
 Redevelopment
 Division

MDEQ Offshore Assessment - 2017

- Sediment and Pore Water Sampling
- Data and Results



MDEQ Offshore Assessment - 2018



Site Groundwater Data and Mixing Zone-Based GSI Criteria

- Groundwater Monitoring identifies increase in select constituent concentrations at GSI Compliance Monitoring points in November 2017 and November 2018
- Increase in concentrations observed primarily in intermediate and deep intervals locations (20 to 30 feet and 35 to 45 feet below the surface, respectively)
- Increased groundwater and lake elevations observed
- Precipitation and storm event frequency and intensity have increased

Response Actions to Acute MZ- Based Criteria

Alternate GSI Compliance Points

- Locations, Rationale,
Statutory relevance

July 2019

July 2019 Data
Reporting and
Work Plan to EGLE

September 2019

July 2019

Data indicates
additional
monitoring points
necessary to
further GSI
boundaries

November 2019

Additional
monitoring points
and initiation of
monthly
monitoring
schedule

Alternate/Additional Monitoring Points - July 2019



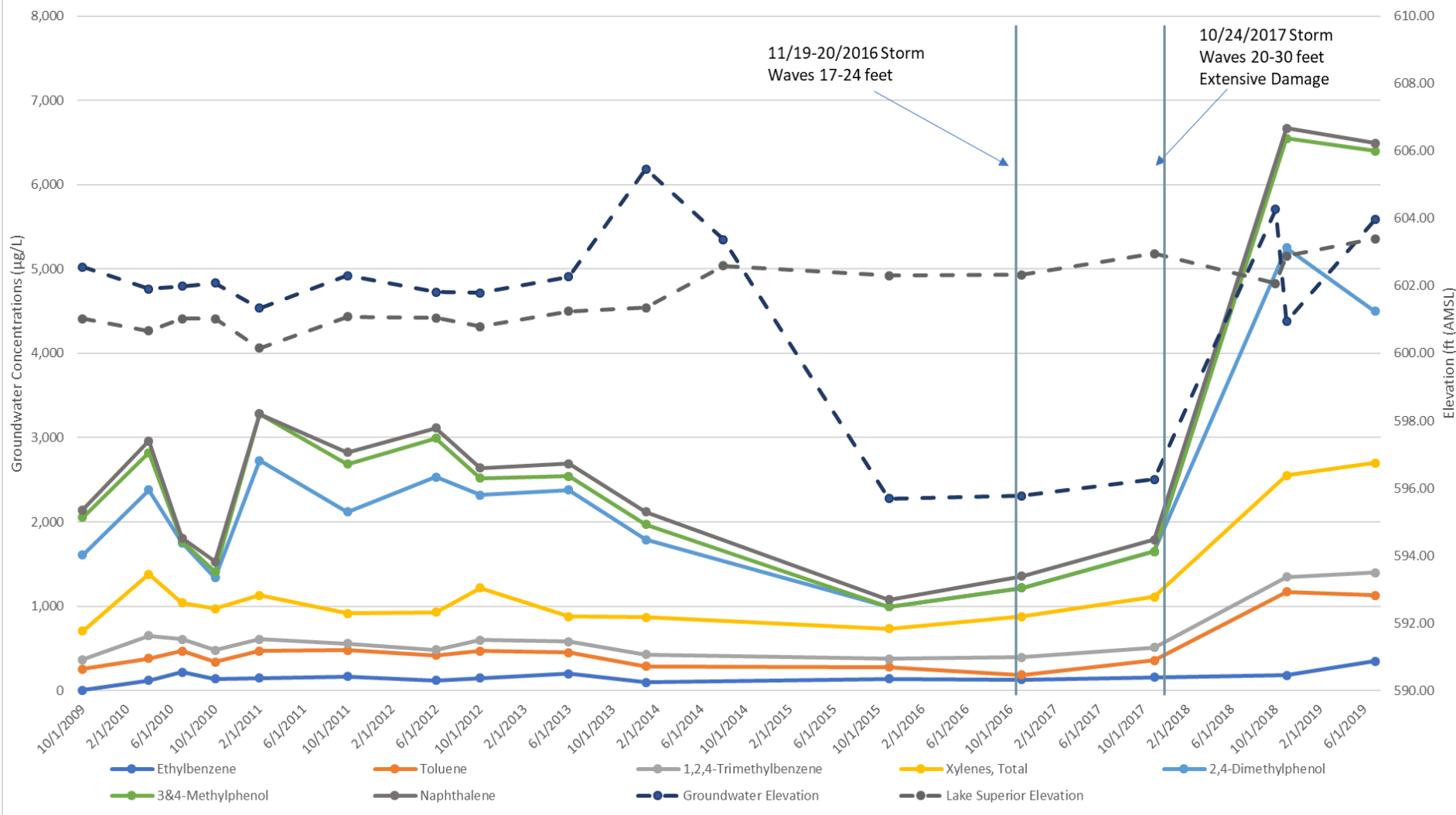
Monitoring Data - July 2019



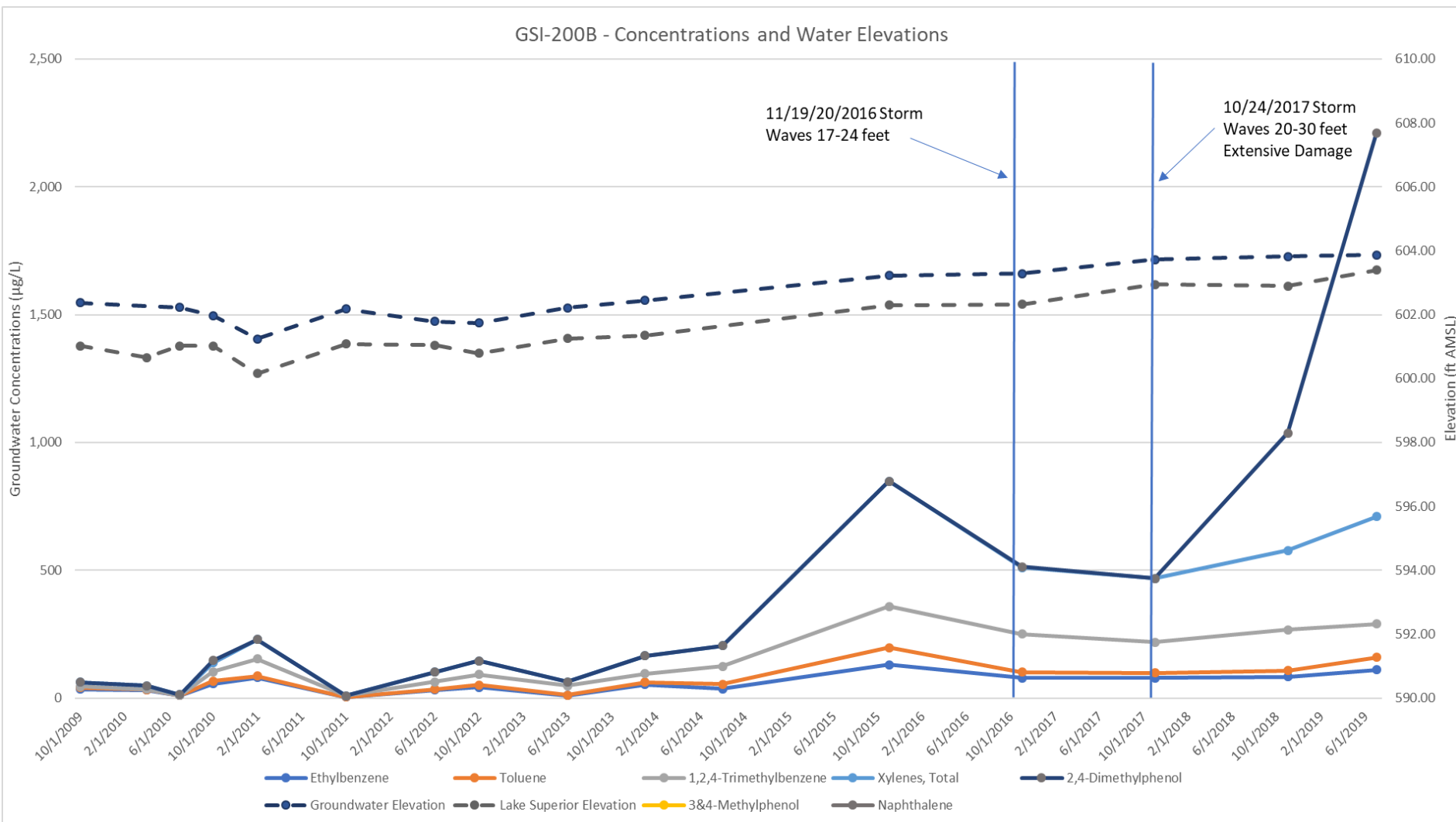
- Further definition of groundwater plume boundaries
- GW concentrations above Acute Mixing Zone-Based Criteria at certain locations
- Additional lakeshore monitoring points necessary
- Additional interior monitoring point necessary

GSI-100B Groundwater Concentrations vs. Elevations and Storm Events

GSI-100B - Concentrations and Water Elevations



GSI-200B Groundwater Concentrations vs. Elevations and Storm Events





Recent Storm Events

10/24/2017 - Significant Damage to Picnic Rocks Park and Lakeshore Boulevard

11/27/2019 - Lakeshore Boulevard damaged from Wright Street to Hawley Street

Site Redevelopment

Lakeshore Boulevard Relocation and Beach Restoration

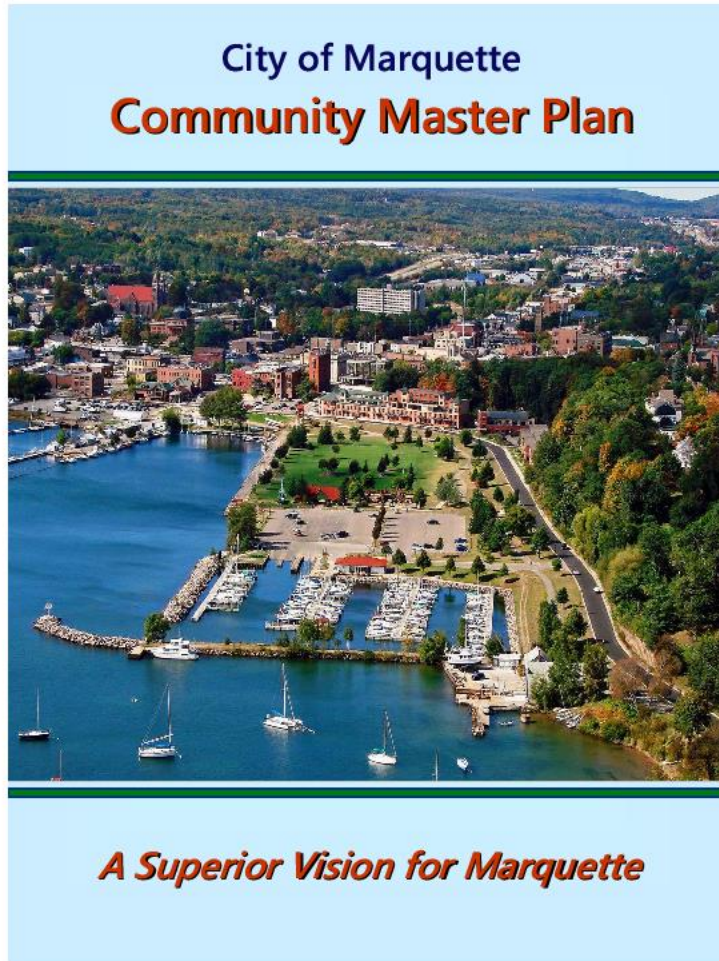


Lake Boulevard Relocation



Beach Restoration Concept Rendering

Site Redevelopment



- City Master Plan
 - Community Input
 - Property Re-use
 - Future Land Use Map Creation
- City Strategic Plan
 - Lakeshore Boulevard Relocation
 - Create Economic Development Opportunity

Property Transfer

- A potential new owner or operator is obligated to conduct all appropriate inquiry (commonly referred to as: performing due diligence) to evaluate whether environmental contamination is potentially present on a piece of property.
- If contamination is present above one or more residential criteria, then the property is contaminated.
- The new owner or operator can conduct a Baseline Environmental Assessment to obtain liability protection for existing contamination.
- The new owner or operator has “Due Care” obligations, which requires them to take measures to prevent unacceptable exposures to hazardous substances or create conditions that worsen the contamination.

EGLE Involvement

- EGLE is committed to working with owners, operators, and purchasers of contaminated properties to facilitate safe redevelopment of property contaminated with hazardous substances.
- Michigan offers incentives for redeveloping contaminated, blighted, and functionally obsolete properties, including tax increment financing, brownfield site assessments, and grants and loans.

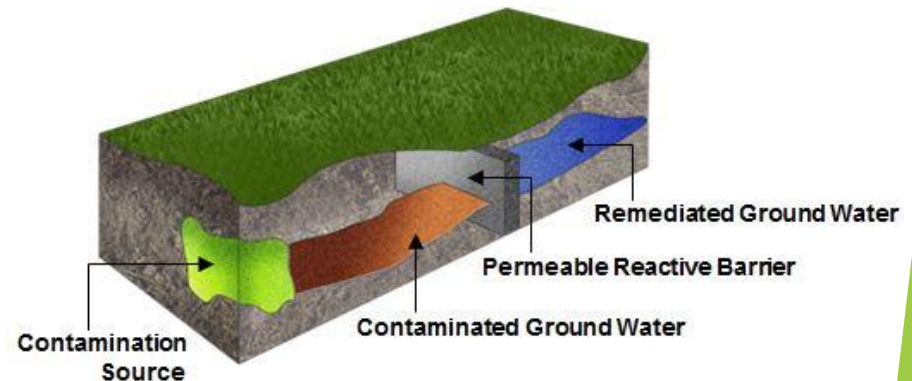
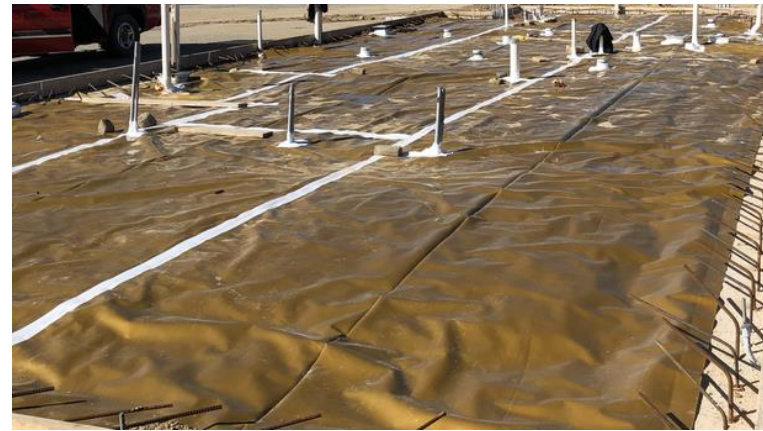
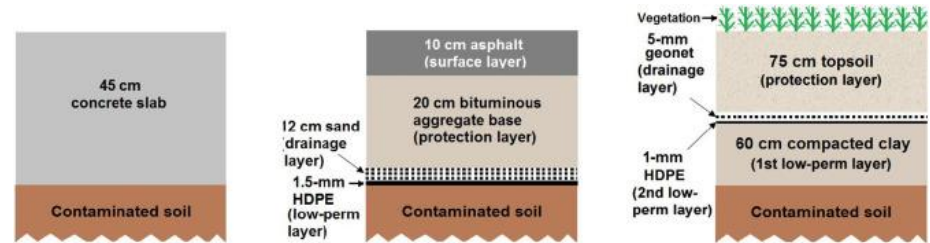
Brownfields

- Brownfield Opportunities
 - Powerful tool used in the successful redevelopment of many contaminated properties across Michigan and the nation
 - Through the Brownfield Redevelopment Financing Act, Brownfield tax increment financing (TIF) allows applicable taxing jurisdictions to receive property taxes on the property at the current level and capture the incremental increase in tax revenue resulting from a redevelopment project.
 - TIF to reimburse brownfield related costs incurred while redeveloping contaminated, functionally obsolete, blighted or historic properties
 - Has resulted in over \$30 million in redevelopment activities that are reimbursable expenses to the developer and the City Brownfield Redevelopment Authority



Redevelopment

- Redevelopment activities must include measures to contain and/or prevent exposure to contamination
- These measure include the use Engineering and Institutional Controls
- Engineering Controls - physical mechanisms to prevent exposure
 - Capping contaminated soil
 - Vapor Mitigation Systems (active or passive)
 - Groundwater Migration Barriers
- Institutional Controls - legal and administrative mechanisms to prevent exposure
 - Land use controls
 - Groundwater use restriction - already in place, future development would use municipal water supply as required by ordinance



Commission Discussion